

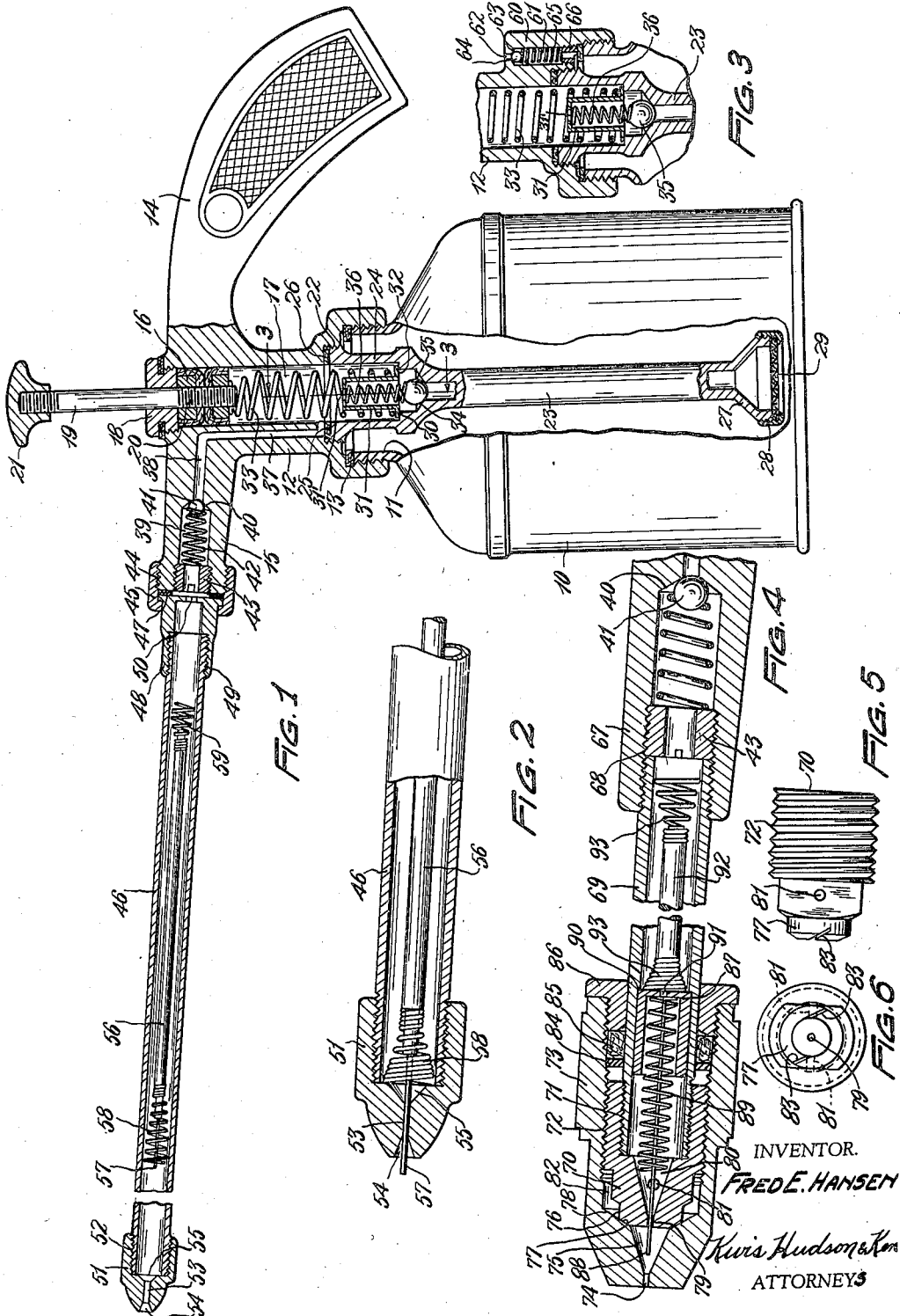
May 24, 1938.

F. E. HANSEN

2,118,451

NOZZLE

Filed Aug. 30, 1935



UNITED STATES PATENT OFFICE

2,118,451

NOZZLE

Fred E. Hansen, Lakewood, Ohio

Application August 30, 1935, Serial No. 38,597

7 Claims. (Cl. 299—59)

This invention relates to lubricating devices and, more particularly, to oilers having a force pump therein for discharging the oil, under pressure, in the form of spray or a stream.

5 In devices of this kind, it is customary to have a nozzle that is provided with a relatively small orifice through which the oil is discharged, and trouble is had with these devices on account of the orifice becoming clogged with sediment or
10 other material. It has been customary to free the orifice, when it has become clogged, by forcing therethrough, from the exterior, a wire or pin, but the objection to this is that it merely pushes the clogging material back into the nozzle and it soon gets into the orifice again and
15 stops the flow of oil. To overcome this difficulty, I have provided a nozzle having a device therein which forces the clogging material outwardly and which is always available to do this by simply giving the oiler a quick snap or throwing
20 motion.

A further object is to provide an oiler that is adapted to discharge the oil in the form of spray or a stream.

25 A further object of the invention is to provide an improved form of pump that will be simple in construction and relatively inexpensive so that the whole device may be sold at a moderate price.

30 Other objects of the invention and the features of novelty will be apparent from the following description, taken in connection with the accompanying drawing, of which

Fig. 1 is a composite view, partly in elevation and partly in section, of an oiler embodying the features of my invention;

Fig. 2 is an enlarged longitudinal section of the discharge end of the nozzle showing my orifice-cleaning device in operative position;

40 Fig. 3 is a detail section on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged longitudinal section of a modified form of the nozzle shown in Fig. 1;

Fig. 5 is a side elevation of the nozzle head
45 shown in Fig. 4; and

Fig. 6 is an end elevation thereof.

Referring to the drawing, 10 indicates a reservoir in the form of a can having a threaded neck 11 at its upper end to which a pump barrel 12 is secured, a gasket 13 being provided to prevent leakage. The pump barrel 12 has a pistol-grip handle 14 on one side and an extension 15, opposite to the handle.

50 A piston 16 is arranged in the bore 17 of the pump barrel and a screw plug 18 closes the up-

per end of the bore 17. A piston rod 19 is secured to the piston 16 by the screw threads 20, and is provided with a button 21 at its upper end which may be conveniently engaged by the thumb of the operator, and the piston thereby
5 depressed, as will be described hereinafter.

The pump barrel 12 is provided with the internal threads 22 at its lower end and a suction tube 23, having an enlarged upper end 24, is secured to the threads 22. A gasket 25 is arranged
10 between the enlarged upper end 24 of the suction tube and the shoulder 26 in the pump barrel. The lower end of the suction tube 23 is enlarged as at 27 and provided with a cap 28 which has a screw threaded connection therewith, the
15 cap carrying a screen 29 which is located close to the bottom of the can 10.

The enlarged upper end 24, of the suction tube, is provided with an internal shoulder 30 on which an inverted cuplike member 31 rests, this member being provided with an opening 31' at its
20 upper end and a flange 32. A coil spring 33 is arranged between the piston 16 and the flange 32, the lower end of this spring surrounding the member 31, as shown. The spring 33 serves to return the piston 16 to the upper end of the bore 17, after it has been released by the operator. There is a valve seat 34 at the upper end of the suction tube 23 and a ball valve 35 cooperates with this seat and is held thereagainst
25 by the spring 36 within the member 31. A discharge port 37 extends longitudinally of the pump barrel 12 and, at its upper end, turns at right angles in the extension 15, as shown at 38.

The extension 15 has a bore 39 at the inner
35 end of which there is a valve seat 40 for the ball valve 41, which is held against the seat by a spring 42, the outer end of this spring being engaged by the hollow nut 43. The outer end of the extension 15 is provided with the external
40 threads 44 to receive the nut 45 by means of which the nozzle 46 is secured to the extension. A gasket 47 is provided between the end of the nozzle 46 and the end of the extension 15 to prevent leakage at this point.

45 The nozzle 46 comprises a head 48 which has a screw threaded connection with the nozzle tube, as indicated at 49, and the end wall of this head has a central orifice 50.

At the outer end of the nozzle tube there is a
50 head 51 which has a screw threaded connection 52 therewith, and this head is provided with a restricted discharge orifice 53 the opposite ends of which are preferably flared, as indicated at 54 and 55.

Arranged within the nozzle tube is a rod 56 having a needle-like extension 57 on its outer end which is surrounded by a tapered coil spring 58, as shown. The outer end convolutions of the spring 58 fit loosely within the nozzle tube but serve to hold the extension 57 in alignment with the orifice 53. The inner end of the rod 56 is also, by preference, provided with a coil spring 59 which is adapted to engage the end wall of the head 43 to cushion the blow of the rod against the end wall when the rod moves inwardly in the nozzle tube. It will be noted that the rod 56 is considerably shorter than the distance between the opposite ends of the nozzle so that it will be capable of considerable longitudinal movement therein.

In using the device, the operator presses downwardly on the button 21 and this movement forces the oil, in the pump barrel, out through the port 37, past the check valve 41, and through the nozzle, from whence it is discharged through the orifice 53. If the orifice 53 becomes clogged, the operator simply tilts the device to point the nozzle upwardly and then, by a quick, downward, snapping movement, causes the rod 56 to be thrown to the outer end of the nozzle where the spring 58 engages the head 51, the inertia of the rod causing the spring to be compressed and permitting the extension 57 to pass through the orifice 53, as shown in Fig. 2. The spring 58 will then expand and withdraw the extension 57 from the orifice. From Fig. 1 it will be noted that the free length of the spring 58 is such that the extension 57 is normally held out of the orifice 53.

When the operator releases the button 21, after having depressed the piston 16, the spring 33 will move the piston to the upper end of its suction stroke and cause the oil to be drawn upwardly through the suction tube 23, past the check valve 35, and into the bore 17. The piston 16 may then be again depressed and the oil forced out of the bore 17 through the nozzle, as previously described.

It is necessary to provide a vent for the reservoir 10 so that air will be admitted thereto as the oil is withdrawn and such a vent is shown in detail in Fig. 3. A lug 60 is provided on the side of the pump barrel 12 and has a bore 61 and a vent opening 62, a valve seat 63 being provided at the inner end of the vent opening 62. A ball valve 64 is normally held against the seat 63 by the spring 65 which is backed up by the plug 66, and this plug has a longitudinal opening therethrough, as shown. The spring 65 is very light but sufficiently strong to hold the ball 64 normally against its seat. However, when there is a slight vacuum within the reservoir 10, due to the withdrawal of oil therefrom, the ball valve 64 will open and admit air.

In the form of the invention illustrated in Figs. 4, 5, and 6, the extension 67, which corresponds with the extension 15 of the construction illustrated in Fig. 1, is internally threaded as at 68, to receive the hollow nut 43 and the nozzle tube 69. A head 70 is secured on the outer end of the tube 69 by means of the screw threads 71 and is externally screw threaded as indicated at 72 to provide means for mounting the rotatable cap 73 thereon. The cap 73 has a restricted discharge orifice 74 at its outer end and a conical passage 75 leading thereto. The outer end of the head 70 is reduced in diameter, as indicated at 76, and has a conical surface 77 which cooperates with a complementary surface 78, on the interior of the cap 73, to form a valve.

The head 70 has a small opening 79 in alignment with the orifice 74 and the passage 80 leading thereto. Transversely extending ports 81 establish communication between the passage 80 and the annular chamber 82 that is provided between the head 70 and the cap 73. One of the surfaces 77 or 78, preferably the surface 77, for convenience of manufacture, is provided with small tangentially extending grooves 83, for a purpose to be later described.

At the inner end of the cap 73 there is a stuffing box comprising the washer 84, the packing 85, and the gland 86, and this stuffing box prevents leakage along the surface of the tube 69.

Within the outer end of the tube 69 there is a slidable cup-shaped member 87 which carries the needle-like member 88, this member being surrounded by the coil spring 89, of which the member 79 may be an axially arranged integral extension. The outer end of the spring 89 is seated in the passage 80 and the member 87 is normally held against the shoulder 90, in the tube 69, which acts as a stop to limit the inward movement of the member 87. An orifice 91 is provided in the end wall of the member 87 for the passage of fluid from the tube 69. A rod 92 having the cushion springs 93 at its opposite ends, is slidably arranged in the tube 69 between the nut 43 and the member 87.

The needle-like member 88 closely fits the opening 79 so that there will be very little flow of fluid through the opening but, at the same time, the member 88 is free to move axially in this opening. The member 88 acts as a cleaner for the orifice 74 and, when the orifice becomes clogged, the operator gives the oiler a quick snapping movement which will throw the rod 92 against the member 87 and drive the latter outwardly, and thus force the member 88 through the orifice 74. The spring 89 then returns the member 87 to the position shown in Fig. 4.

When the surfaces 77 and 78 are in engagement, as shown in Fig. 4, the fluid will be forced through the tangential grooves 83 and thus give a whirling motion which will cause the fluid to issue from the orifice 74 in the form of a spray. By turning the cap 73 a partial revolution, the surfaces 77 and 78 may be separated, thereby opening the valve formed by these surfaces, and then the fluid will issue from the orifice 74 in the form of a fine stream, so that the nozzle may be conveniently used whenever desired for producing a spray or a stream as the operator desires.

While I have illustrated and described what I now consider to be the preferred form of my invention, it is apparent that modifications may be made in the details of construction that have been illustrated and described, without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, I claim:

1. In a device of the class described, a nozzle having a restricted discharge orifice, an element loosely arranged in said nozzle and normally free to slide longitudinally therein in either direction, said element having an end portion adapted to enter said orifice and free the latter of any obstructions therein, and said element also having a compressible member attached thereto and surrounding said portion which normally prevents said portion from entering said orifice but which upon being compressed permits said portion to slide through the orifice.

2. In a device of the class described, a nozzle

having a restricted discharge orifice, a rod normally free to slide longitudinally in said nozzle in either direction and having a needle-like extension at one end adapted to pass through said orifice, and a coil spring attached to said rod and surrounding said extension.

3. In a device of the class described, a nozzle having a restricted discharge orifice, a rod free to slide in said nozzle and having a needle-like extension at one end adapted to pass through said orifice, and springs attached to the opposite ends of said rod with one of said springs surrounding said extension.

4. In a device of the class described, a nozzle having a restricted discharge orifice, a rod free to slide in said nozzle and having a needle-like extension at one end adapted to pass through said orifice, and springs attached to the opposite ends of said rod with one of said springs surrounding said extension and said springs being of such size as to slidably fit within said nozzle and maintain said extension in alignment with said orifice.

5. In a device of the class described, a nozzle having a restricted discharge orifice, a rod loosely arranged in said nozzle and normally free to slide longitudinally thereof in either direction, said rod having a needle-like extension adapted to pass through said orifice, and spring means

which normally maintains said extension away from said orifice but adapted to be compressed by said rod to force said extension through the orifice to remove an obstruction therefrom.

6. In a device of the class described, a nozzle having a restricted discharge orifice, a member slidable in said nozzle and carrying a needle-like element adapted to be projected through said orifice, means for normally holding said member in a retracted position with said element free from said orifice, and a member freely and independently slidable in said nozzle and adapted to strike the first mentioned member to actuate the latter and force said element through said orifice.

7. In a device of the class described, a nozzle having a restricted discharge orifice, a needle-like element positioned in said nozzle in alignment with said orifice, a spring which normally holds said element in retracted position away from said orifice, and a member loosely arranged in and freely slidable longitudinally of said nozzle in either direction and adapted, upon a quick snapping movement of said nozzle, to be projected toward said orifice and effect the compression of said spring and force said element through said orifice.

FRED E. HANSEN.